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Practice Limited to the Eye  
Cataract Surgery & Intraocular Lenses  
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## Intraocular Lenses (IOLs)

During cataract surgery, your eye's natural lens – which has become cloudy – is removed and replaced with a permanent artificial lens implant called an **intraocular lens (IOL)**. IOLs are made of flexible, foldable plastic, and are only about one-third the size of a dime.

Before IOLs were developed, you had to wear extremely thick eyeglasses or special contact lenses to be able to see after your cataract was removed. Now there are several different types of IOLs available for patients undergoing cataract surgery. The different IOL designs will affect how you will see when you are not wearing eyeglasses. You and your ophthalmologist (Eye M.D.) will work closely together to determine the best IOL choice based upon your individual needs and objectives.

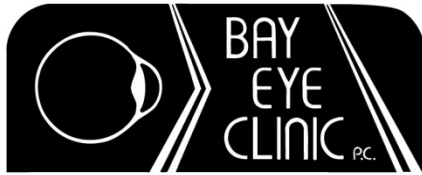
Before surgery is performed, your eyes are measured to determine the correct power of IOL for you. Just as there are different strengths or powers in eyeglasses, there are also different powers of IOLs from which to choose. Your ophthalmologist will choose the correct power for you based on your exam and measurements.

## Traditional IOLs

The traditional IOLs that have been in use for several decades are called **monofocal lens implants** because they provide a single focus when you are not wearing eyeglasses. Depending upon the lens power selected by the eye surgeon, the eye may see best at either far, near, or intermediate (midrange) distance when eyeglasses are not worn. Most people who have cataract surgery with a traditional IOL choose to have a lens that provides better distance vision without eyeglasses.

If you choose a traditional monofocal lens, you can expect to see as good as possible at all distances when the appropriate eyeglasses are worn. However, without eyeglasses, your natural focus will generally be best at only one of the three ranges – far, intermediate, or near.

With a monofocal IOL set for distance, you will need to wear reading glasses for close-up vision. If you choose to have a monofocal IOL set for near vision, allowing you to read without eyeglasses, then you will need eyeglasses to see clearly in the distance. This same condition – the need to wear eyeglasses to change focus – affects everyone by their mid-40s due to a natural aging condition known as **presbyopia**.



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## Monovision

If you are having cataract surgery, you may want to consider a strategy called monovision. This technique uses traditional monofocal IOLs to allow for near or intermediate vision in one eye and distance vision in the other eye. Not everyone is comfortable with this difference in focus, but many people find they adapt well to monovision when they try it out first using contact lenses before having cataract surgery. Your ophthalmologist can discuss the pros and cons of monovision with you.

## Premium IOLs

In addition to traditional IOLs, there are other IOL options that have more recently become available for use with cataract surgery. They are called **premium IOLs** because they have additional features and they cost more. These include IOLs to reduce astigmatism (**Toric IOL**) and IOLs which have a bifocal effect (**Multifocal IOL**).

## Astigmatism and Toric IOLs

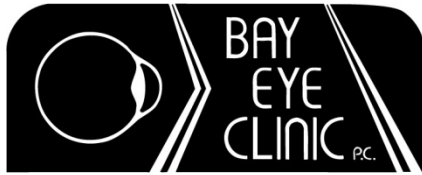
If your cornea is irregularly shaped (not spherical), it may produce a natural blur called astigmatism, requiring you to wear eyeglasses. This condition will persist after cataract surgery. With the cataract removed and a traditional lens implanted, a person's astigmatism may be corrected with eyeglasses. However, if you want better vision after cataract surgery without eyeglasses, your ophthalmologist may treat the astigmatism by making extra incision in your cornea called **limbal relaxing incisions (LRIs)**. Another way to reduce astigmatism is with a toric IOL.

**Toric IOLs** are monofocal lens implants that incorporate some of the astigmatism correction that would otherwise be achieved with eyeglasses. Toric IOLs will not entirely eliminate the need for eyeglasses. However, people with astigmatism who have toric IOLs should be able to see better without eyeglasses than if they had a traditional IOL instead. Your ophthalmologist will help you decide if astigmatism correction is needed or possible, and how best to achieve this correction.

## Multifocal IOLs

If you want to be less dependent on eyeglasses for both near and distance vision after cataract surgery, a new generation of IOLs may help achieve this. **Multifocal IOLs** provide the option of seeing better at more than one distance when you are not wearing eyeglasses or contacts.

Multifocal lenses use specially designed focal zones on the surface of the lens. Light rays are focused through the different zones to provide focal images at both near and distance. The ability to read without eyeglasses can vary because of individual factors, but is generally best when the multifocal lens implant is placed in both eyes. With multifocal lenses, you generally should see better at near range without eyeglasses than if you had received a traditional monofocal IOL.



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Multifocal IOLs seek to provide people with the convenience of being able to see better when they are not wearing eyeglasses or contact lenses. However, it is important to understand that these newer IOLs should reduce, but will not eliminate entirely, the need for eyeglasses.

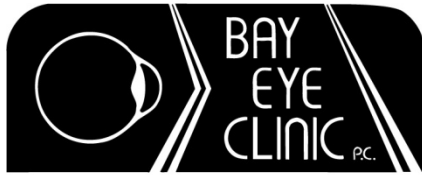
In addition, there may be certain factors that can decrease your satisfaction with multifocal IOLs. For instance, the multifocal IOLs are not able to correct or reduce astigmatism. Residual astigmatism may limit your vision without glasses after surgery with a multifocal IOL (or traditional IOL). Reduction of astigmatism when using a multifocal IOL needs to be addressed with corneal surgery. Limbal relaxing incisions (LRIs) at the time of surgery or with LRIs and/or laser refractive surgery (PRK or LASIK) sometime after cataract surgery may be useful. We anticipate having **toric multifocal IOLs** available once they are FDA approved for use in the U.S.A.

Also, multifocal IOLs may produce some glare and nighttime halos. Although most patients adapt to these conditions, they may be more bothersome to some people. Finally, the size of your pupils and the presence of other eye problems can affect how well these lenses work for you. Your ophthalmologist can discuss these and other factors with you if you are considering multifocal lenses with cataract surgery.

## Considerations When Choosing an IOL Type

**Your vision needs.** It is important that you understand what different IOLs realistically can and can't do for you, and that you consider how important it is for you to reduce your dependence on wearing eyeglasses after cataract surgery. You and your ophthalmologist will discuss your specific goals before surgery to find the best intraocular lens for you. For instance, if you want to be able to see well in the distance without eyeglasses, but don't mind wearing eyeglasses for reading or computer work, a traditional monofocal IOL may be fine for you. Or, if you have significant astigmatism a toric IOL might be the best option. If you want to reduce how often you need to wear eyeglasses (and you would tolerate possible night vision glare/halos), a multifocal IOL might be the best option to achieve such convenience. Try to prioritize your needs, so that you and your ophthalmologist can discuss the appropriate IOL options.

**Cost.** You'll also need to think about cost when considering your IOL options. Cataract surgery with the traditional monofocal IOL is covered by Medicare, Medicaid and nearly all health insurance plans. However, premium IOLs that provide the convenience of seeing better without eyeglasses are not considered medically necessary, therefore, their additional cost is not covered by health insurance. Patients who want the potential convenience provided by premium IOLs must pay out of pocket for the extra costs associated with the premium IOL, but the cataract surgery itself is still covered when medically necessary. Your ophthalmologist's office will discuss the additional costs with you.



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**Risks and Complications.** The success rate of cataract surgery and IOL implantation is very high. As with any surgery, however, there are potential risks, and your doctor will go over these with you. Fortunately, the odds of improving your vision are extremely high with modern cataract surgery.

It is important to remember that even if a premium IOL is chosen, eyeglasses will still be needed for some visual tasks. Also, remember that multifocal IOLs may cause visual disturbances, such as glare and nighttime halos around lights.

Sometimes cataract surgeons need to perform enhancement surgery after cataract surgery with multifocal IOLs. This means you may need to have additional surgery after the first procedure in order to achieve least dependence from eyeglasses or contacts. Enhancements don't mean that the original procedure failed; it is likely your vision is fine with eyeglasses even if your vision without glasses is less than optimal. You might be a candidate for another procedure such as PRK or LASIK or astigmatism correction to fine-tune your uncorrected vision.

Millions of people each year have had their quality of vision restored with cataract surgery. With the various IOL options available, with the help of your ophthalmologist, you can select the right lens for your vision needs, enhancing your quality of life.